

What is claimed is:

1 1. A device for detecting a turbo pump drive state in a tendetron accelerator of a
2 semiconductor ion implantation device, comprising:
3 a turbo pump formed inside of the accelerator;
4 a current detecting part formed inside of the accelerator for detecting a turbo pump
5 driving current applied to the turbo pump, and providing a first electrical signal indicative of
6 the detected turbo pump driving current;

7 an electro-optical converter formed inside of the accelerator for converting the first
8 electrical signal to an optical signal;

9 a photoelectric converter formed outside of the accelerator for converting the optical
10 signal to a second electric signal;

11 an optical cable formed between the electro-optical converter and the photoelectric
12 converter for carrying the optical signal out of the accelerator; and

13 a displaying part formed outside of the accelerator for receiving the second electric
14 signal and displaying the turbo pump driving current contained in the second electric signal.

1 2. The device for detecting a turbo pump drive state as recited in claim 1, further
2 comprising an interlock generator formed outside of the accelerator for comparing the
3 second electric signal with a set current range, and generating an interlock signal when the
4 second electric signal is out of the set current range.

1 3. The device for detecting a turbo pump drive state as recited in claim 2,
2 further comprising an accelerator power supply formed outside of the accelerator for
3 providing power to the accelerator,
4 wherein the accelerator power supply receives the interlock signal generated from the
5 interlock generator, and
6 wherein the accelerator power supply stops providing power to the accelerator when
7 it receives the interlock signal.

1 4. The device for detecting a turbo pump drive state as recited in claim 1, further
2 comprising:
3 a generator formed inside of the accelerator for generator drive power; and
4 an electrical cable for supplying the drive power to the turbo pump,
5 wherein the current detecting part is electrically connected to the electrical cable.

1 5. The device for detecting a turbo pump drive state as recited in claim 1, further
2 comprising a stripper formed inside the accelerator, wherein the current detecting part and
3 the electro-optical converter are assembled on a board and disposed in the stripper, thereby
4 preventing dielectric breakdown.

1 6. The device for detecting a turbo pump drive state as recited in claim 5, wherein
2 the optical cable maintains an electric insulating state between a ground of the tendetron
3 accelerator and a high voltage of the stripper.

1 7. A method of detecting a turbo pump driving state in a tendetron accelerator of a
2 semiconductor ion implantation device, the method comprising:
3 detecting a current applied to a turbo pump in the tendetron accelerator;
4 outputting the detected current as an optical signal;
5 transmitting the optical signal through an optical fiber that passes from inside of the
6 accelerator to outside of the accelerator;
7 converting the optical signal transmitted through the optical fiber to an external
8 electric signal; and
9 displaying a current value of the external electric signal.

1 8. The method of detecting a turbo pump driving state as recited in claim 7,
2 wherein after detecting the current applied to a turbo pump, the method further
3 comprises generating an internal electrical signal indicative of the detected current, and
4 wherein the outputting of the detected current as an optical signal is performed by
5 converting the internal electrical signal to the optical signal.

1 9. The method of detecting a turbo pump driving state as recited in claim 7, further
2 comprising:

3 comparing the current value of the external electrical signal with a set current value
4 range; and

5 cutting off a power supply of the accelerator when the current value of the external
6 electrical signal is out of the set current value range.

09063484-092704
1 10. The method of detecting a turbo pump driving state as recited in claim 9, further
2 comprising generating an interlocking signal when the current value of the external electrical
3 signal is out of the set current value range.